

NASA TECH BRIEF



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Miniature Bearings Lubricated by Sonic Dispersion Method

The problem: Precise lubrication of miniature precision ball bearings to prevent lubricant "bleed out" to adjacent components. Direct application of the lubricant does not give the desired results in the smaller bearings.

The solution: A process that evenly distributes a monomolecular film over the balls and the tracks by sonic dispersion.

How it's done: The technique involves a careful cleaning process followed by immersion in a sonically agitated bath containing the desired lubricant suspended in an appropriate liquid carrier. The lubricant is deposited on the bearing surfaces from a very dilute solution in a volatile liquid solvent which, in its purest form, leaves no residue upon evaporation. The solvent must be one that has no undesirable effect on any part of the bearing or on adjacent parts if the bearing is in a subassembly. The solvent used is actually a liquid carrier only and with the lubricant added, a mixture is obtained rather than a solution. Homogeneity of this mixture is maintained by ultrasonic generation or other agitation means.

When a clean ball bearing assembly is immersed in this mixture under generation, withdrawn and allowed to drain, a definite quantity of the solvent/lubricant

mixture will remain on the bearing surfaces. The amount (depth of film) of this residue is controlled by the lubricant-to-solvent ratio of the mixture.

Notes:

1. Bearings are never to be handled with bare hands. Plastic gloves or clean tweezers must be used.
2. By varying the lubricant-to-solvent ratio of the mixture, varying lubricant coating thicknesses can be achieved for different duty applications.
3. This method can be applied to any bearing assembly regardless of structure complexity so long as it is not completely sealed.
4. Inquiries concerning this innovation may be directed to:

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Reference: B65-10106

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Litton Industries
under contract to Marshall Space Flight Center
(M-FS-202)

Category No. 03